



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,139	03/17/2004	Kazuhiko Omote	04176/LH	3276
1933	7590	06/17/2005	EXAMINER	
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC 220 5TH AVE FL 16 NEW YORK, NY 10001-7708			SUCHECKI, KRYSZYNA	
			ART UNIT	PAPER NUMBER
			2882	
DATE MAILED: 06/17/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/802,139

Applicant(s)

OMOTE, KAZUHIKO

Examiner

Krystyna Suchecki

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/21/04;09/14/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verman (US 6,069,934) in view of Gutman (US 6,014,423) and Lentfer (US 2003/0068010).

3. Regarding Claims 1 and 3-5, Verman teaches an X-ray diffraction apparatus in which:

- a. (a) said X-ray diffraction apparatus comprises an incident optical system (12, 45), a sample support mechanism (44), a receiving optical system (16), and receiving-optical-system rotating means (51), and an X-ray emitted from the incident optical system is incident on a sample supported by the sample support mechanism, and an X-ray diffracted by the sample is detected by the receiving optical system;
- b. (b) the receiving-optical-system rotating means (51) has a function to rotate the receiving optical system around a first axis of rotation for changing an angle which is defined by a direction of the X-ray incident on the sample and an optical axis of the receiving optical system (Column 5, lines 1-37);
- c. (c) the incident optical system includes an X-ray source (12) and a multilayer-film mirror (35) which has a function to focus an X-ray emitted from the X-ray source within a plane perpendicular to the first axis of rotation. The multilayer film mirror may be of any shape that is beneficial for directing x-rays (Column 3, lines 59-65).

Art Unit: 2882

- d. Verman also teaches that the sample can be rotated in at least one direction by any suitable goniometer (Column 5, lines 1-37) and that the sample may be moved to obtain flux strength, angular range and/or resolution (Column 4, lines 15-26). When the sample is moved, a resultant motion must be performed by the detector in order to track the motion of the sample (Column 5, lines 18-37).
4. Verman fails to specifically teach the multilayer film mirror as a collimating mirror which includes either a first reflection surface with a parabolic shape for collimating an X-ray within a first plane perpendicular to the first axis of rotation and a second reflection surface with a parabolic shape for collimating an X-ray on a second plane perpendicular to the first plane or a first reflection surface with a parabolic shape for collimating an X-ray within first plane perpendicular to the first axis of rotation and second reflection surface with an elliptical-arc shape for focusing an X-ray on the sample within perpendicular to the first plane. Verman also fails to teach (d) the sample support mechanism includes attitude controlling means which has a function to switch a condition of the sample support mechanism from a state maintaining the sample to have a first attitude in which a normal line of the surface of the sample is substantially parallel with the first axis of rotation to another state maintaining the sample have a second attitude in which the normal line of the surface of the sample is substantially perpendicular to the first axis of rotation; (e) the sample support mechanism includes first incident-angle controlling means which has a function to rotate the sample around a second axis of rotation which is substantially perpendicular to the first axis rotation for changing an incident angle of an X-ray which emitted from the incident optical system and incident on the surface the sample the first attitude; and (f) the sample support mechanism includes second incident-angle controlling means

Art Unit: 2882

which has a function to rotate the sample around the first axis of rotation for changing the incident angle of an X-ray which is emitted from the incident optical system and incident on the surface of the sample in the second attitude. While the rotation arm of Verman is attached to the rotation means of the sample, Verman fails to teach the receiving optical system as turning around the second axis of rotation too.

5. Gutman teaches teach the multilayer film mirror as a collimating mirror (Column 3, lines 28-34) which includes either a first reflection surface with a parabolic shape for collimating an X-ray within a first plane perpendicular to the first axis of rotation and a second reflection surface with a parabolic shape for collimating an X-ray on a second plane perpendicular to the first plane or a first reflection surface with a parabolic shape for collimating an X-ray within first plane perpendicular to the first axis of rotation and second reflection surface with an elliptical-arc shape for focusing an X-ray on the sample within perpendicular to the first plane (Column 3, line 14- Column 4, line 6). The alternate shapes allow for increased x-ray flux and decreased unwanted characteristic radiation (Column 4, lines 1-6).

6. Lentfer teaches a goniometer system wherein (d) the sample support mechanism includes attitude controlling means (item 20 cooperating with items of Paragraphs 46 and 47) which has a function to switch a condition of the sample support mechanism (at 20[Phi]) from a state maintaining the sample to have a first attitude in which a normal line of the surface of the sample is substantially parallel with the first axis of rotation to another state maintaining the sample have a second attitude in which the normal line of the surface of the sample is substantially perpendicular to the first axis of rotation; (e) the sample support mechanism includes first incident-angle controlling means (20[Chi]) which has a function to rotate the sample around a

Art Unit: 2882

second axis of rotation which is substantially perpendicular to the first axis rotation for changing an incident angle of an X-ray which emitted from the incident optical system and incident on the surface the sample the first attitude; and (f) the sample support mechanism (at 20[Phi]) includes second incident-angle controlling means (20[Omega]) which has a function to rotate the sample around the first axis of rotation for changing the incident angle of an X-ray which is emitted from the incident optical system and incident on the surface of the sample in the second attitude. The goniometer allows for precise sample positioning with a reduction of cost and effort for sample placement (Abstract and Paragraphs 23-24). The goniometer allows great flexibility in sample positioning and reduces errors due to static sample placement (Paragraphs 22, 25-27).

7. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the collimating mirrors of Gutman in the system of Verman since the collimating mirrors allow for increased x-ray flux and decreased unwanted characteristic radiation (Gutman, Column 4, lines 1-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the goniometer of Lentfer in the system of Verman since the goniometer allows for precise sample positioning with a reduction of cost and effort for sample placement (Lentfer, Abstract and Paragraphs 23-24) and flexibility in sample positioning and that reduces errors due to static sample placement (Lentfer, Paragraphs 22, 25-27). The increased flexibility of sample placement would require a cooperating ability of the receiving optical system to track the sample, and therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the receiving optical system turn around the second axis of rotation too, in order to track the sample.

Art Unit: 2882

8. Regarding Claim 2, Lentfer teaches an apparatus according to Claim 1, wherein the attitude controlling means and the first incident-angle controlling means are actualized by a common mechanism (20).

9. Regarding Claim 6, Lentfer teaches an apparatus according to Claim 1, wherein the sample support mechanism includes a mechanism for moving the sample in a direction perpendicular to the surface of the sample (10_y), a mechanism for translating the sample two-dimensional direction within a plane parallel with the surface of the sample (10_x), a mechanism (20) for rotating the sample around two axes (y_p and x_p) of rotation which are orthogonal to each other and pass on the surface of the sample, and a mechanism (at 20[Phi]) for an in-plane rotation (about axis z_p) of the sample.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (571) 272-2495. The examiner can normally be reached on M-F, 9-5.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Art Unit: 2882

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W

ks

Craig E Church

Craig E. Church
Primary Examiner